

20-Series High Resolution Color Monitors

TM20-20RH/RP, TM14-20RH/RP



20-Series Color Monitors

The 20-Series color monitors are Auto Setup broadcast monitors designed to meet today's demanding professional needs with state-of-the-art digital technology.

With optional plug-in decoder boards, the 20-Series will accept different TV standards (NTSC, PAL-B, SECAM, PAL-M, D1, D2, D3) which can be selected (NTSC, PAL-B, SECAM, PAL-M: automatically selected)

- In-line gun CRT with fine dot pitch shadow mask.
- Auto setup module are standard.
- Beam Feedback System (BFS)
- Infrared Remote Controller (Option)
- Optional adaptive comb filter



Features

High Performance Cathode Ray Tube

- Fine Dot Pitch Shadow Mask results in high resolution. Dot trio pitch 0.31mm for TM14-20RH/RP and 0.43mm for TM20-20RH/RP.
- In-line Self Converging Electron Gun assures convergence stability.
- Controlled Phosphors to ABS or EBU Standards provide consistent and known colorimetry.
- Black Matrix surrounding Phosphor Dots assures high contrast under bright ambient lighting.
- 13V and 19V units available.

Digital Control System (DCS)

The preset control system is completely digitized with the 8 bit MPU and the 10 bit D/A converter. It enables several status indications, and auto setup capability with an optional PROBE (ASP-15C). Since a rotary encoder for preset controls and variable resistors for manual controls (CONTRAST, BRIGHTNESS, CHROMA, HUE) are provided, the 20-series monitors can be adjusted in the same manner as conventional analog-controlled monitors.

Auto Setup System

By using an optional Auto Setup Probe (ASP-15C), the following functions can be automatically setup at a reference level or stored in less than 50 seconds.

- CONTRAST
- CHROMA
- RGB BACKGROUND
- BRIGHTNESS
- HUE(NTSC)
- GB GAIN

Remote Control Operation

An infrared remote controller (RCT-20) is provided as an option. With each of them, the following functions can be remotely controlled for up to 99 monitors.

- DEGAUSS
- DEALY SELECT
- VIDEO SELECT
- APERTURE ON/OFF
- COLOR/MONO
- RED GUN ON/OFF
- WIDE/NORMAL/UNDERSCAN
- GREEN GUN ON/OFF
- MENU
- SAFE TITLE

- BLUE GUN ON/OFF
- H. PHASE
- GB GAIN
- CHROMA
- WIDTH
- H. CENT
- V. CENT
- RGB BACKGROUND
- HUE
- HEIGHT
- SYNC INT/EXT
- CONTRAST
- BRIGHTNESS

Beam Feedback System(BFS)

To insure long-term black level stability, the 20-series monitor incorporates Beam Feedback System(BFS) which detects CRT cathode current deviation and eliminates brightness changes due to changes in CRT emission.

Adaptive Comb Decoder*

By incorporating a CCD 1H delayline into the standard comb filter, cross luminance and cross color are improved over conventional monitors. In addition, by replacing it with an optional Adaptive Comb Filter Decoder* (NTSC only), performances of 20-Series are significantly improved for precision color monitoring or graphics display.

Improvements include:

- Chroma edges are greatly improved by patented process based on use of luminance transitions.
- Dot crawl at chroma transitions is eliminated.

(* Under license from Faroudja laboratories)

Wide Range of Input Capabilities

The 20-Series can accept 3 composite video inputs and an RGB or a component (Y, R-Y, B-Y) input as standard. Optional plug-in decoder boards are available for Digital (D1, D2, D3), PAL-B, SECAM, PAL-M TV standard systems.

Modular Concept

The 20-Series provides modular construction for ease of repair and adjustment. The boards of video system are plug-in, and many of the boards can be removed with the monitor mounted in a rack.

Specifications

Input Voltage 100~120, 200~240VAC+/-10%(Auto select)50/60Hz

Input Power 160W

Standard Accessory Remote connector, Power cable, Operation Manual

Input Facilities

- Input Signals
 - *Encoded video
 - NTSC or PAL-B or PAL/SECAM or PAL-M 3ch
 - TM20/14-20RH..... NTSC Decoder standard
 - TM20/14-20RP..... PAL Decoder standard
 - Other decoders are options.
 - (*Two of them can be installed simultaneously
 - two slots construction)
 - *R/G/B or Y,R-Y,B-Y
 - (MII or BETA switchable internally) 1ch
 - *D1(4:2:2), D2(D3) -Option
 - PARALLEL input 1ch
 - SERIAL input 2ch
 - SERIAL output 1ch(monitor OUT)
 - *Y/C (option) 1ch

●Input Level

- *Encoded Video
 - Composite 1Vp-p
 - Non Composite 0.7Vp-p
- *RGB 0.7Vp-p Non Composite
 - Sync on Green
 - No Sync on Red + Blue or
 - Sync Red Green Blue or External Sync
- *Analog Component (Y, R-Y, B-Y)
 - MII Y signal White level 700mVp-p
 - (N10) Setup level 0mVp-p
 - (SMPTE) Sync level 300mVp-p
 - R-Y signal p-p level 525mVp-p
 - B-Y signal p-p level 525mVp-p
 - (100/0/75/0 Color bar)
 - Beta Y signal White level 714mVp-p
 - Setup level 53.6mVp-p
 - Sync level 286mVp-p
 - R-Y signal p-p level 700mVp-p
 - B-Y signal p-p level 700mVp-p
 - (100/7.5/75/7.5 Color bar)
 - *Y/C Y signal 1Vp-p
 - C signal 0.286Vp-p (burst level)

●Connection

Bridging BNC connectors, high impedance, isolated from chassis ground.

●Return loss

Less than 46dB (up to 10MHz)

●Crosstalk between adjacent channel

Less than 50dB (up to 6MHz)

●Hum suppression

60dB with 4V RMS common mode rejection

●Remote control (via 10 pin connector)

Video input selector (A/B/C)
AUX (RGB, Y/R-Y/B-Y)
Sync
Color killer (COLOR/MONO)
Tally (ON/OFF)

Display Device

In-line gun, shadow mask high resolution CRT

TM14-20RH/RP: 0.31mm

TM20-20RH/RP: 0.43mm

●Chromaticity

*ASP standard	X	Y
R	0.630	0.340
G	0.310	0.595
B	0.155	0.070
*EBU standard	X	Y
R	0.640	0.330
G	0.290	0.600
B	0.150	0.060

*Tolerance +/-0.005

●Brightness/Contrast

*Preset Contrast

35Ft-L at factory setting(100% window signal)

*Max brightness

TM14-20RH/RP: More than 70Ft-L w/window signal

TM20-20RH/RP: More than 70Ft-L w/window signal

●Resolution (at 35Ft-L)

TM14-20RH/RP: 700TV Lines (at center)

TM20-20RH/RP: 700TV Lines (at center)

Output Facilities (option)

Y	0.7Vp-p
R-Y	0.525Vp-p
B-Y	0.525Vp-p
	(100/0/75/0 Color bar)

Video Signal System

●RGB Response 50 ~ 10MHz +1, -3dB

●Luminance

*Frequency Response

w/o Notch: +/-1dB at 50Hz to 7MHz

w/Notch: -30dB at 3.58MHz

w/comb: +/-1dB at 50Hz to 7MHz

	(w/o Notch)	(w/Notch)	(w/Comb)
*2T pulse to base line	<+/-1%	<+/-2%	<+/-1%
*2T pulse to Bar	<+/-1%	<+/-2%	<+/-1%
*T step	<1%	<1%	<1%
*Distortion	<1%	<1%	<1%
*Square wave response	<1%	<1%	<1%

●Linearity

Differential Gain less than 2%

●Black level varies: less than 1% (APL 10% ~ 90%)

●Color temperature stabilities: less than 1% for 500hours, +10°C ~ +40°C

●Aperature correction

*Correction characteristics

Waveform of overshoot of 2T pulse appears symmetrically with TRAP ON.

*Frequency response

60Hz to 100KHz: less than +/-1dB

1MHz: less than +2dB

2.5MHz: less than +6dB

3.58MHz(NTSC): less than -15dB

4.43MHz(PAL): less than -15dB

●Noise (at each RGB in active scan period)

Coherent Noise less than -46dB

Hum Noise less than -55dB

Other less than -55dB



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Specifications

Color Signal System	w/COMB	w/TRAP
●Chrominance Suppression in	>24dB	>30dB
●Luminance	at 4.43 or 3.58MHz	at 4.43 or 3.58MHz
●Luminance Suppression in	>20dB	-----
●Chrominance	at 4.43 or 3.58MHz	at 4.43 or 3.58MHz
●Chroma/Luma Delay	<20nsec.	<20nsec.

- Chroma Signal Response
 - NTSC 2.3MHz to 4.9MHz: +1, -3dB (reference 3.58MHz)
 - PAL-B 3.1MHz to 5.7MHz: +1, -3dB (reference 4.43MHz)
- Demodulator Axis
 - R-Y VS B-Y 90 degree
- Oscillator Performance
 - Subcarrier Lock-in
 - +/-200Hz (NTSC/PAL-M)
 - +/-300Hz (PAL-B)
- Phase Error
 - Less than 2 degree for each of following individual conditions:
 - a)Burst frequency: +/-10Hz
 - b)Burst level change: +6dB, -12dB
 - c)Ambient temperature change by +10'C
 - d)Sync-blanking within FCC requirement
- Color Killer
 - Automatic operation when burst level is less than 5 +/-1 IRE.
- Adjustments
 - *Chroma amplitude: +/-6dB
 - *Subcarrier phase: +/-15 degree

Raster + Deflection

- Scan
 - *Normal scan
 - Aspect ratio 4:3 with blanked raster 1%
 - *Under scan
 - Aspect ratio 4:3 approx. -7.5% (adjustable 90% of normal scan)
 - *Over scan
 - 105% of normal scan
- Stability of Raster Size
 - 1% of picture height 0 ~ 100% APL at 35Ft-L reference
- Linearity H + V line
 - 0.5% of picture height
- Geometry Entire Screen
 - 0.5% of picture center
- AFC Time Constant
 - Normal: 2msec
 - Fast: 0.5msec
 - Slow: 7msec
- Retrace Time
 - Horizontal: 0.9usec.
 - Vertical: 0.8msec.
- High Voltage
 - *Tolerance: TM14-20RH/RP 25kV+/-0.5kV
 - TM20-20RH/RP 25kV+/-0.5kV
 - *Regulation: within +/-1% at 0 to 450uA
- Convergence
 - Center: <0.3mm(within circle of 80% of picture height)
 - Corners: <0.5mm(outside area of picture center)

Functions

- Adaptive Comb Decoder (option)
- Safe Title Generator
 - (100,95,90,85,80%, 100+90+80%, 5 CROSS HATCH, 10 CROSS HATCH selectable)
- Auto Setup
 - (with an optional probe)
- Infrared Remote Control (with an optional remote control box)
- Test Signals
 - *Cross Hatch, * Flat Field(50%), *Window (100%), *10step stair signal with plugs as standard, *Character

- Video A/B Split (reference & variable vertical position)
- Color/Mono Split (reference & variable vertical position)
- Beam Feedback System
- Menu Assist
 - *Contrast, Brightness, Chroma, Hue, G. Gain, B. Gain, R.BLG, G.BLG, B.BLG, Aperture Level, Height, Width, V.Cent, H.Cent, Rotation, F.Focus, H.Phase
 - *Safe Title Setup
 - *Split Setup
 - *System Setup
 - Decoder Select (NTSC/PAL-B/PAL-M/SECAM)
 - Test Signal ON/OFF
 - *Mode Setup
 - User Display ON/OFF
 - Aux RGB/Y,R-Y,B-Y
 - CH C / Y/C
 - Level Display ON/OFF
 - Control Lock Setup

Front Control

- Outside of Drawer
 - *Power ON/OFF
 - *Degauss ON
 - *Color/Mono
 - *Sync INT/EXT
 - *Video Select (A/B/C/Aux/Digital/Test/A-B split)
 - *Delay (H Delay, V Delay, HV Delay)
 - *Scan (UNDER, Normal, OVER)
 - *Aperture ON/OFF
 - *Screens (R/G/B ON/OFF)
 - *Safe Title ON/OFF
 - *Contrast, Brightness, Chroma, Hue Preset/Manual
- Inside of Drawer
 - *Setup ON/OFF
 - *AUTO/FORCED COLOR
 - *AFC Normal/Fast/Slow
 - *Residual Subcarrier
 - *File Control
 - *Rotary Encoder
 - *Preset Change
 - Contrast, Brightness, Chroma, Hue, RGB Background, GB Gain., Rotation, Aperture Level, Fine Focus, Height, Width, H Center, V Center, H Phase

Dimensions

TM14-20RH/RP:
450(W) x 265(H) x 515(D) mm
17.72(W) x 10.43(H) x 20.28(D) inches

TM20-20RH/RP:
450(W) x 399(H) x 515(D) mm
17.72(W) x 15.71(H) x 20.28(D) inches

Weight
TM14-20RH/RP: 26kg (57.3 lbs) approx.
TM20-20RH/RP: 38kg (83.8 lbs) approx.

Design and specifications are subject to change without notice.